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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,670	09/21/2001	Makoto Higashiyama	F-7168	5592

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NEW YORK, NY 10168

EXAMINER

LEHNER, WILLIAM P

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/960,670

Applicant(s)

HIGASHIYAMA, MAKOTO

Examiner

William P Lehner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/21/01 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because FIG 4 fails to show the viewpoint of the virtual camera as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:
3. Page 1, line 10 "motor-booting" is misspelled
4. Page 26, line 5 "embraced" should not be in the past tense. Change to "embrace"
5. Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3, 7, 8, 10, 14, 15, and 16 are rejected under 35 U.S.C. 103(a) as being anticipated by Yasui (6356264) in view of Foley.

8. In regard to claim 1 and 15, note Yasui's image processing method for creating a shadow (column 1, lines 5-10), shadow volume formed by polygons (column 1, line 24), storage for vertices of polygons forming the shadow model (column 5, lines 25-27), sorting means for sorting the polygons forming the shadow model (column 4, lines 38-44), and a rendering step for pixels judged to have shadow (column 3 lines 31-33). Yasui is lacking front-facing polygons minus back-facing polygons to form a shadow volume. Instead, Yasui counts the shadow polygons between the viewpoint and the examined position and if the count is odd the position is in shadow (column 1, lines 46-55). The problem with this is that a position in an area of intersecting shadow volumes will have an even count of shadow polygons and will be falsely judged to not be in shadow. Foley discloses a shadow creating algorithm that creates a shadow under the area of the front-facing polygons minus the back-facing polygons (page 750, lines 5-7) because this is the area contained in the shadow volume. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yasui's image processing method to create a shadow under the front-facing shadow polygons minus the back-facing shadow polygons as taught by Foley because this method does not have the aforementioned problem.

9. In regard to claim 3 and 10, note Yasui's shadow image creating means (column 3, lines 17-21), shadow image storage (FIG 3), rendering step for shading pixels judged to have a shadow (column 3, lines 31-33), z-values (column 2, lines 13-15), and his method of z-values of shadow polygons (column 4, lines 19-55 and FIG 1).

10. In regard to claims 7 and 14, Yasui discloses a graphics and gaming system with shadows for three-dimensional objects, but is lacking movable characters. Virtually every gaming system has movable characters because it is exciting to do so (Official Notice). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yasui's gaming system with moving characters in order to have an exciting game.

11. In regard to claim 8, note Yasui's recording medium (column 2, line 46), and the above rejections to claim 1.

12. In regard to claim 16, note Yasui's game program storage, input/output, operating unit, display means (FIG 10, elements 72, 73, 74, and 40), and the above rejections to claim 1.

13. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasui (6356264) in view of Foley as applied to claim 1 above, and further in view of Minami (6542151). Yasui and Foley disclose an image processing method for creating shadows. Yasui and Foley do not sort the polygons using an inner product; instead, they are counted as described in the above rejection to claim 1. Minami discloses a method of storing normal vectors of polygons and determining if these polygons are front-facing or back-facing based on the sign of their inner product (column 13, line 61 – column 14, line 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yasui and Foley's image processing method to store normal vectors and use an inner product as taught by Minami because

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the polygon orientation can be determined and the problem in the above rejection to claim 1 is avoided.

14. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasui (6356264) in view of Foley as applied to claim 1 above, and further in view of Yamaguchi (6529194). Yasui and Foley disclose an image processing method for creating shadows. They are lacking a method of shading by multiplying the frame color by the shadow color; instead they use Gouraud shading. Yamaguchi discloses a method of shading polygons multiplying their color value by beta (column 24, lines 1-2), so that texture mapping does not need to be performed (column 23, line 63). Beta refers to the intensity of the shadow. In the case of a point light source, beta is equal to 1.0 and would be a predetermined value (Official Notice). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yasui and Foley's image processing method to multiply the frame color by a predetermined value as taught by Yamaguchi because this method allows skipping the texture mapping.

15. Claims 4, 6, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasui (6356264) in view of Foley as applied to claim 1 above, and further in view of Nakatsuka (6433782). Yasui and Foley disclose an image processing method for creating shadows. They are lacking a method of shading by multiplying the frame color by the shadow color; instead they use Gouraud shading. Nakatsuka discloses a method of shading polygons in the plotting region or frame buffer by subtracting their color value by shadow color (column 30, lines 41-53) because this

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calculates each pixel's luminance (column 30, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yasui and Foley's image processing method to subtract the shadow color from the frame color as taught by Nakatsuka because this calculates each pixel's luminance. The shadow color is a predetermined value.

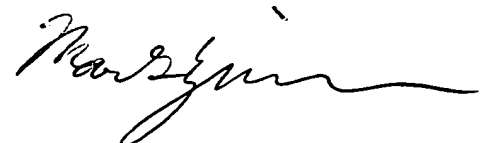
Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William P. Lehner whose telephone number is 703-305-0682. The examiner can normally be reached on 8:30 - 5 M-F.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on 703-305-9798. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-308-9051 for After Final communications.

18. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

WPL
August 19, 2003



MARK ZIMMERMAN
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